SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch

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TEST REPORT

Application No.:	SZEM1612011127CR
Applicant:	XDynamics Limited
Address of Applicant:	Unites 216-217, Photonics Centre NO.2 Science Park East Avenue, Hong Kong
Manufacturer:	XDynamics Limited
Address of Manufacturer:	Unites 216-217, Photonics Centre NO.2 Science Park East Avenue, Hong Kong
Factory:	Vtech Communications Ltd
Address of Factory:	Vtech Holding, Liaobu Town, Dongguan, Guangdong
Equipment Under Test (EUT):	
EUT Name:	EVOLVE
Model No.:	EVOLVE Drone
FCC ID:	2ALI6XD-D1-EVOLVE
Standard(s) :	47 CFR Part 1.1307, Part 1.1310
Date of Receipt:	2017-06-28
Date of Test:	2017-07-22 to 2017-10-20
Date of Issue:	2018-03-29
Test Result:	**Pass***

* In the configuration tested, the EUT complied with the standards specified above.

Keny Xu
EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

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Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
01		2018-03-29		Original

Authorized for issue by:				
				
		Hank Yan /Project Engineer		
				
		Eric Fu /Reviewer		

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2 Contents

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3 General Information

3.1 Details of E.U.T.

Power supply:	DC 17.4V 6700mAH Li-ion battery			
For 2.4G FHSS:				
Operation Frequency:	2404MHz to 2467MHz			
Modulation Type:	GFSK			
Number of Channels:	43			
Channel Spacing:	1.5MHz			
Antenna Type:	Integral Antenna			
Antenna Gain:	2dBi			
For 5G Certified module (FCC ID: VQSAMNPTTX01):				
Operation Frequency:	Band	Mode	Frequency Range(MHz)	Number of channels
	Band 1	10MHz Bandwidth	5175 ~ 5245	8
		20MHz Bandwidth	5180 ~ 5240	4
		40MHz Bandwidth	5190 ~ 5230	2
	Band 2A	10MHz Bandwidth	5255 ~ 5325	8
		20MHz Bandwidth	5260 ~ 5320	4
		40MHz Bandwidth	5270 ~ 5310	2
	Band 2C	10MHz Bandwidth	5495 ~ 5705	22
		20MHz Bandwidth	5540 ~ 5700	9
		40MHz Bandwidth	5510 ~ 5670	5
	Band 3	10MHz Bandwidth	5740 ~ 5820	9
		20MHz Bandwidth	5745 ~ 5825	5
		40MHz Bandwidth	5755 ~ 5795	2
Modulation Type:	OFDM, BPSK			
Channel Spacing:	10MHz Bandwidth: 10MHz 20MHz Bandwidth: 20MHz 40MHz Bandwidth: 40MHz			
Antenna Type:	PIFA Antenna			
Antenna Gain:	5dBi			

3.2 Description of Support Units

The EUT has been tested as an independent unit.

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3.3 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

3.4 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• CNAS (No. CNAS L2929)

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC

Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

• A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

• VCCI

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

• FCC –Designation Number: CN1178

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

• Industry Canada (IC)

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.

3.5 Deviation from Standards

None

3.6 Abnormalities from Standard Conditions

None

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4 Radio Spectrum Technical Requirement

4.1 RF Exposure

4.1.1 Test Requirement:

CFR 47 Part 1.1310, RSS-102 Issue 5, Section 3.2

Limit:

According to FCC Part1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in Part1.1307(b)

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	$*900/f^2$	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	$*180/f^2$	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

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According to RSS-102 Issue 5 section 3.2 Table 4, the RF Field Strength Limits for Devices Used by the General Public is below:

Table 4: RF Field Strength Limits for Devices Used by the General Public (Uncontrolled Environment)

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m^2)	Reference Period (minutes)
0.003-10	83	90	-	Instantaneous*
0.1-10	-	$0.73/f$	-	6**
1.1-10	$87/f^{0.5}$	-	-	6**
10-20	27.46	0.0728	-2	6
20-48	$58.07/f^{0.25}$	$0.1540/f^{0.25}$	$8.944/f^{0.5}$	6
48-300	22.06	0.05852	1.291	6
300-6000	$3.142 f^{0.3417}$	$0.008335 f^{0.3417}$	$0.02619 f^{0.6834}$	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	$616000/f^{1.2}$
150000-300000	$0.158 f^{0.5}$	$4.21 \times 10^{-4} f^{0.5}$	$6.67 \times 10^{-5} f$	$616000/f^{1.2}$

Note: f is frequency in MHz.
* Based on nerve stimulation (NS).
** Based on specific absorption rate (SAR).

According to IEEE C95.3:2002 section 5.5.1.1, The power density S at a point on the axis at a distance d from a transmitting antenna is given by the Friis free-space transmission formula

$$S = \frac{PG}{4\pi d^2}$$

S = power density (mW/cm^2)
P = the net power delivered to the antenna (mW)
G = gain of the antenna in linear scale
d = distance between observation point and center of the radiator (cm)

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4.1.2 EUT RF Exposure Evaluation

1) exposure conditions for standalone operations

For 2.4G Band:

Antenna Gain: 1.5dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.413 in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

Channel	Frequency (MHz)	Max Tune-up Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)	Limit (mW/cm^2)	MPE Ratios	Result
Middle	2435.5	18.230	66.527	0.019	1.0	0.019	PASS

Note: The distance R (5th column) calculated from the Fries transmission formula is far greater than 20 cm separation requirement.

For 5.8G Band:

Antenna Gain: 5dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 3.162 in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

Channel	Frequency (MHz)	Max Tune-up Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)	Limit (mW/cm^2)	MPE Ratios	Result
Middle	5795.0	23.900	245.471	0.154	1.0	0.154	PASS

Note: The max output power is refer to the report of the RF module (FCC ID: VQSAMNPTTX01).

The distance R (5th column) calculated from the Fries transmission formula is far greater than 20 cm separation requirement.

2) exposure conditions for simultaneous transmission operations

Simultaneous transmission MPE test is not required, because the Max. sum of the MPE ratios is 0.019+0.154=0.173 < 1

- End of the Report -

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